

Draft Environmental Assessment

For

Upland Hunt Plan

**Merritt Island National Wildlife Refuge
Titusville, FL**

October 21, 2013

Comment Due Date

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or

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1.0 PURPOSE OF AND NEED FOR PROPOSED ACTION ALTERNATIVE

1.1 Introduction:

The United States Fish and Wildlife Service (USFWS), is proposing to open approximately 6,000 acres on the northern section of the refuge to a limited quota deer hunt with unlimited take of feral hogs. This proposal applies to specified lands owned by the National Aeronautics and Space Administration (NASA) and managed by the USFWS as a National Wildlife Refuge (NWR). This Environmental Assessment (EA) is being prepared to evaluate the effects associated with this proposal and complies with the National Environmental Policy Act (NEPA) in accordance with Council on Environmental Quality regulations (40 CFR 1500-1509) and Department of the Interior (516 DM 8) and Service (550 FW 3) policies (see Section 1.7 for a list of additional regulations that this EA complies with). NEPA requires examination of the effects of proposed actions on the natural and human environment. In the following chapters, two alternatives are described and environmental consequences of each alternative are analyzed.

1.2 Location:

The Merritt Island National Wildlife Refuge (Refuge), located along Florida's east central coast about 60 miles east of the city of Orlando in Brevard and Volusia Counties, was established by agreement as an overlay of the NASA's John F. Kennedy Space Center in 1963 (Figure 1). According to the agreement with NASA, the lands and waters of the Kennedy Space Center are primarily to serve the space program and secondarily to serve as a wildlife refuge or park. The Refuge derives its name from Merritt Island, which, along with Cape Canaveral, is a barrier island complex that is one of the last extensive undeveloped barrier islands on the eastern coast of Florida. The Refuge includes three major water bodies that are all part of the Indian River lagoon system: the Indian River Lagoon, Mosquito Lagoon, and the Banana River.

The Refuge covers more than 140,000 acres, of which approximately 34,345 acres in and around Mosquito Lagoon were designated as a joint management area between the National Park Service and the USFWS through a congressional act establishing Canaveral National Seashore. Natural resource and public use management of much of the joint jurisdiction area is under Merritt Island NWR management, while the National Park Service is responsible for management of all cultural resources in this overlap area.

The proposed hunt area (Figure 2) includes approximately 6,000 acres of upland habitat along State Road 3, north of Haulover Canal between the Indian River Lagoon and Mosquito Lagoon. The area lies within Volusia and Brevard Counties, FL. The lands east of State Road 3, are in the joint management area between the National Park Service and the USFWS.

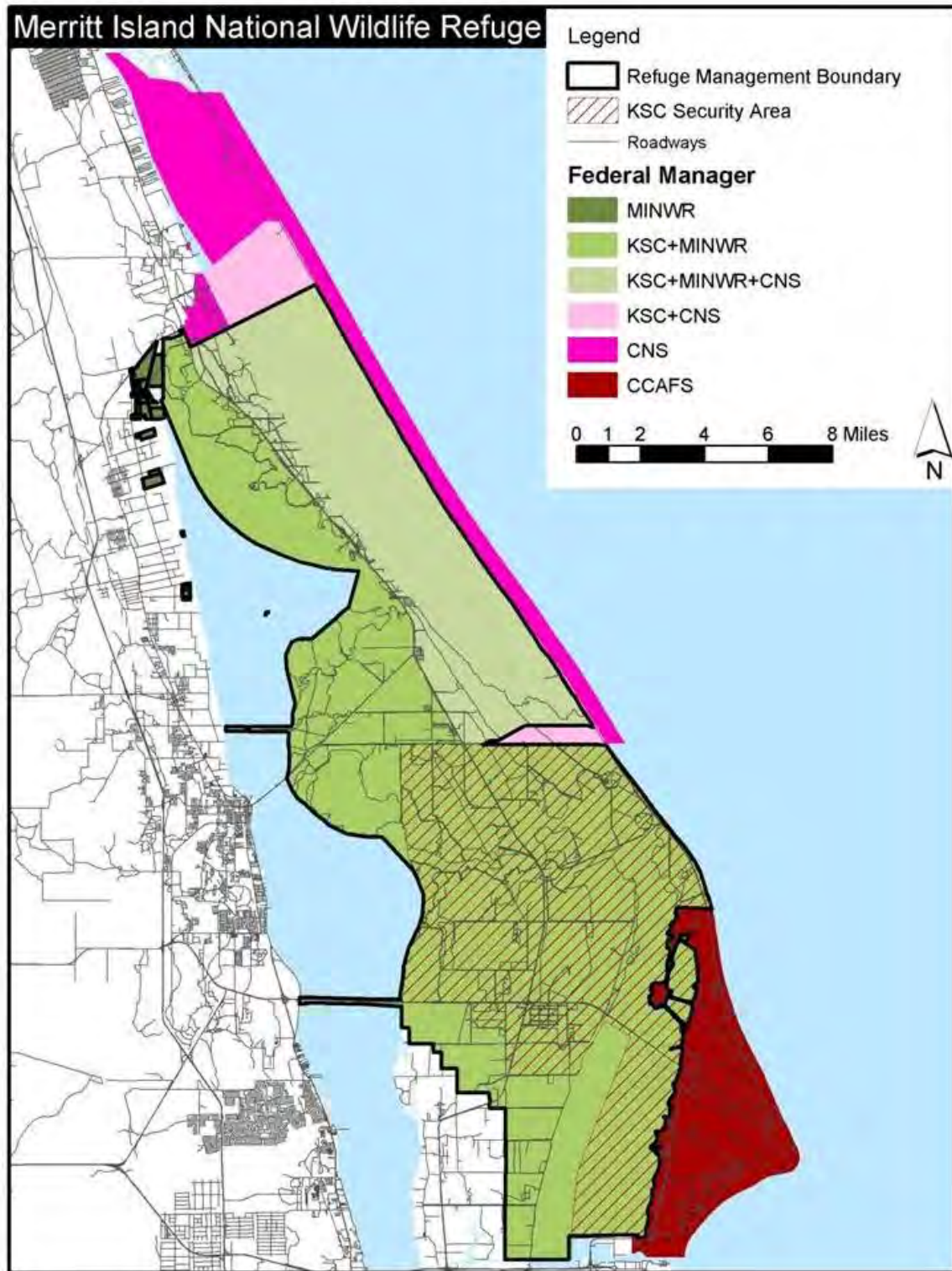


Figure 1. Federal Land Ownership map of Merritt Island in Florida, USA. Entities include: John F. Kennedy Space Center (KSC), Merritt Island National Wildlife Refuge (MINWR), Canaveral National Seashore (CNS), and Cape Canaveral Air Force Station (CCAFS).

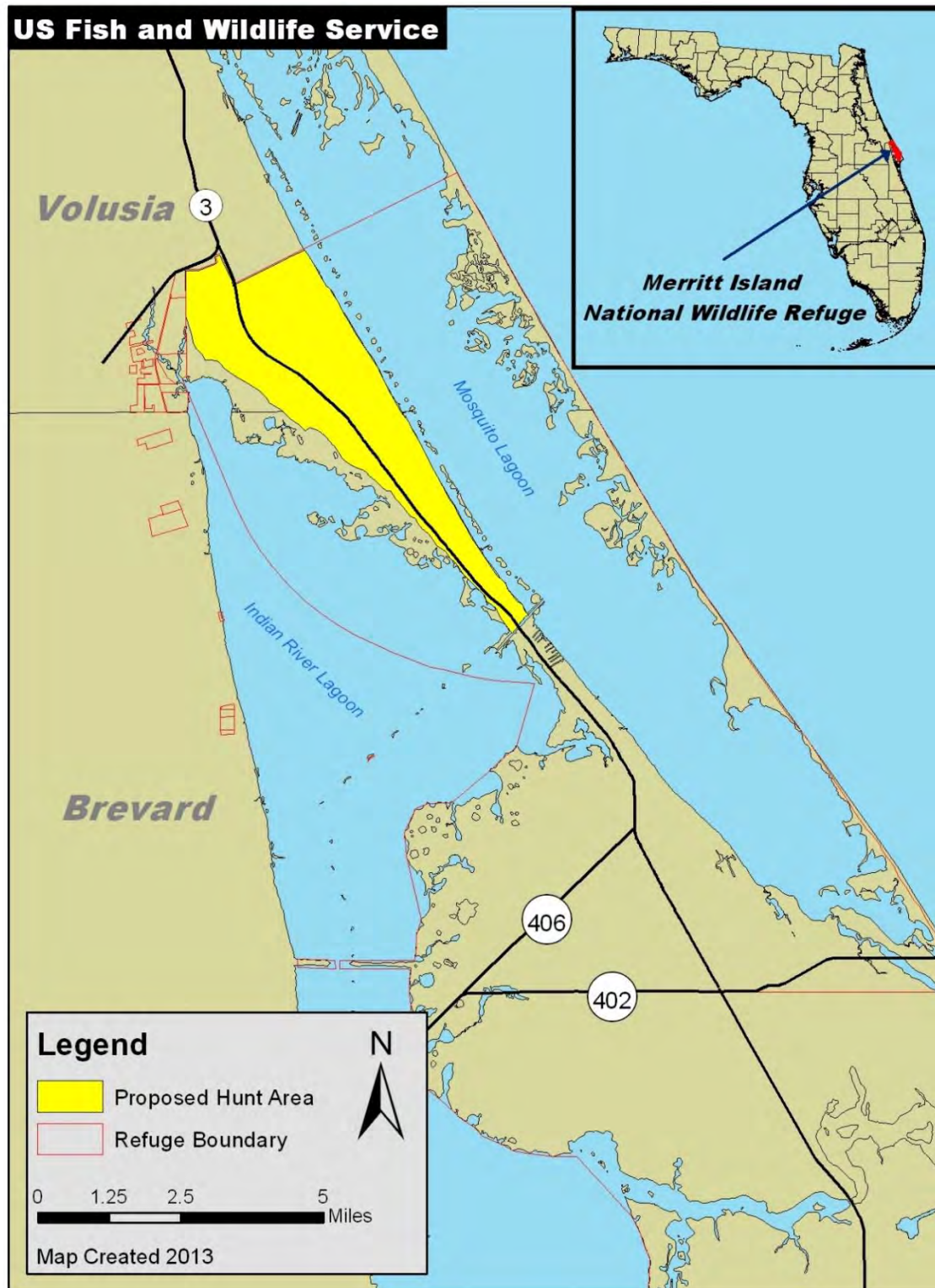


Figure 2. Proposed Upland Hunt areas on Merritt Island National Wildlife Refuge in Brevard and Volusia Counties, Florida, USA.

1.3 Background:

Hunting has been a traditional use on the land that is now managed as the Merritt Island National Wildlife Refuge since before the Refuge was established. Before NASA began acquiring the land for space exploration in the late 1950's and early 1960's, several small communities were established on Merritt Island and hunting was a way of life. Hunting and fishing provided food for families living in these communities and provided income for some who operated guided hunting and fishing trips.

Shortly after the Refuge was established in 1963, waterfowl hunting was evaluated and opened to the public. During the negotiations for land purchases, NASA made commitments to retain hunting and the original interagency agreement between NASA and the refuge made provisions to continue this use. The Refuge has had a successful waterfowl hunt program for many years. During the Refuge's Comprehensive Conservation Plan (CCP, 2008), an additional upland hunt for deer and feral hog was found compatible with stipulations. Those stipulations include the following: maintain low hunter densities, provide high quality habitat for white-tailed deer, and provide opportunities for other wildlife-dependent recreation during the upland hunt season.

The upland hunt would include incidental take of feral hogs which would assist the refuge in removal of these invasive species. Feral hogs were first introduced to Florida, and to North America, in 1539 by Spanish colonizers in the form of 13 free ranging domestic pigs in Lee County (Mayer et al. 1991). The pigs were used by early settlers as a source of food. Feral hogs have hybridized with free ranging pigs in the area over the last four centuries. Since their introduction, feral hogs have been documented in every Florida County and in all areas of the Refuge.

Estimates of the hog population on the refuge have varied from 5,000 to 12,000. In attempt to control feral hog numbers, the Refuge started a feral hog removal program in 1972. Through the years, the Refuge has utilized trappers to reduce the hog population. Trappers are selected by random drawing to trap and remove hogs. Refuge personnel also remove hogs when needed. Current control efforts remove approximately 2,000 hogs from the refuge annually.

1.4 Purpose and Need for Action:

The National Wildlife Refuge System Administration Act of 1966 as amended by the National Wildlife Refuge System Improvement Act of 1997 (16 U.S.C. 668dd et seq.) provides authority for the Service to manage the Refuge and its wildlife populations. In addition it declares that compatible wildlife-dependent public uses are legitimate and appropriate uses of the Refuge System that are to receive priority consideration in planning and management. There are six wildlife-dependent public uses: hunting, fishing, wildlife observation, wildlife photography, environmental education, and interpretation. It directs managers to increase recreational opportunities including hunting on National Wildlife Refuges when compatible with the purposes for which the Refuge was established and the mission of the National Wildlife Refuge System.

The proposed action is needed to provide the public with a high quality recreational hunting opportunity in Brevard and Volusia Counties without adversely affecting the biological integrity of the Refuge. The Service is proposing an upland game hunt to include deer and feral hog which is designed to be compatible with refuge purposes and consistent with State laws and regulations on 6,000 acres of upland habitat within Merritt Island National Wildlife Refuge. Hunting is an acceptable and traditional form of wildlife-oriented recreation and can be used as a tool to effectively manage game populations. There is a demand for more hunting opportunities in Florida and within the local communities surrounding the Refuge. The proposed action would create additional opportunities for traditional hunting on public lands in Florida and help remove an invasive non-native species on the Refuge.

1.5 Decision to be Made:

The Service's Regional Director will review the recommendations assessed in this EA and select one of the two Alternatives presented. The Regional Director will also determine whether this EA is adequate to support a Finding of No Significant Impact (FONSI) or whether an Environmental Impact Statement will need to be prepared.

To initiate or expand hunting programs, the Service must publish in the *Federal Register* any proposed and final refuge-specific regulations pertaining to that use prior to implementing them. The regulations are only one element of a complete opening package, which is comprised of the following documents: hunting plan; compatibility determination; documentation pursuant to compliance with the National Environmental Policy Act of 1969, as amended and appropriate NEPA decision document; Endangered Species Act section 7 evaluation; copies of letters requesting State involvement and the results of the request; draft news release; outreach plan; and the draft refuge-specific regulations.

This EA serves as the NEPA document which analyzes the impacts on environmental, cultural, and historical resources of providing additional hunting opportunities on the Merritt Island NWR. The Upland Hunt is presented in this document as the preferred alternative. Proposed uses within this plan have been determined to be appropriate and compatible with the mission of the Refuge System and purposes for which the Refuge was established.

1.6 Regulatory Compliance:

National Wildlife Refuges are guided by the mission and goals of the National Wildlife Refuge System (NWRS), the purposes of an individual refuge, Service policy, and laws and international treaties. Relevant guidance includes the National Wildlife Refuge System Administration Act of 1966, as amended by the National Wildlife Refuge System Improvement Act of 1997, Refuge Recreation Act of 1962, and selected portions of the Code of Federal Regulations and Fish and Wildlife Service Manual.

The mission of the Refuge System is:

"... to administer a national network of lands and waters for the conservation, management and, where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within

the United States for the benefit of present and future generations of Americans” (National Wildlife Refuge System Improvement Act of 1997, Public Law 105-57).

The goals of the Refuge System are to:

- *Conserve a diversity of fish, wildlife, and plants and their habitats, including species that are endangered or threatened with becoming endangered;*
- *develop and maintain a network of habitats for migratory birds, anadromous and interjurisdictional fish, and marine mammal populations that is strategically distributed and carefully managed to meet important life history needs of these species across their ranges;*
- *conserve those ecosystems, plant communities, wetlands of national or international significance, and landscapes and seascapes that are unique, rare, declining, or underrepresented in existing protection efforts;*
- *provide and enhance opportunities to participate in compatible wildlife-dependent recreation (hunting, fishing, wildlife observation and photography, and environmental education and interpretation); and*
- *foster understanding and instill appreciation of the diversity and interconnectedness of fish, wildlife, and plants and their habitats.*

The NWRS Improvement Act of 1997 provides guidelines and directives for the administration and management of all areas in the NWRS. It states that national wildlife refuges must be protected from incompatible or harmful human activities to ensure that Americans can enjoy Refuge System lands and waters. Before activities or uses are allowed on a national wildlife refuge, the uses must be found to be compatible. A compatible use “... will not materially interfere with or detract from the fulfillment of the mission of the Refuge System or the purposes of the refuges.” In addition, “wildlife-dependent recreational uses may be authorized on a refuge when they are compatible and not inconsistent with public safety.” The act also recognized that wildlife-dependent recreational uses involving hunting, fishing, wildlife observation, photography, environmental education and interpretation, when determined to be compatible with the mission of the System and purposes of the Refuges, are legitimate and appropriate public uses of the NWRS and they shall receive priority consideration in planning and management.

This EA was prepared by the Service and represents compliance with applicable Federal statutes, regulations, Executive Orders, and other compliance documents, including the following:

- American Indian Religious Freedom Act of 1978 (42 U.S.C. 1996)
- Archaeological Resources Protection Act of 1979 (16 U.S.C. 470)
- Clean Air Act of 1972, as amended (42 U.S.C. 7401 *et seq.*)
- Clean Water Act of 1972, as amended (33 U.S.C. 1251 *et seq.*)
- Endangered Species Act of 1973, (ESA) as amended (16 U.S.C. 1531 *et seq.*)
- Executive Order 12898, Federal Action Alternatives to Address Environmental Justice in Minority Populations and Low Income Populations, 1994.
- Fish and Wildlife Coordination Act of 1958, as amended (16 U.S.C. 661 *et seq.*)

- Floodplain Management (Executive Order 11988)
- National Environmental Policy Act (NEPA) of 1969, as amended (42 U.S.C. 4321 *et seq.*)
- Regulations for Implementing the Procedural Provisions of NEPA (40 CFR 1500 *et seq.*)
- National Historic Preservation Act of 1966, as amended (16 U.S.C. 470 *et seq.*)
- Native American Graves Protection and Repatriation Act of 1990 (25 U.S.C. 3001 *et seq.*)
- Protection and Enhancement of the Cultural Environment (Executive Order 11593)
- Protection of Wetlands (Executive Order 11990)
- National Pollutant Discharge Elimination System, as amended (33 U.S.C. 1251 *et seq.*)
- Executive Order 13112, Invasive Species (issued in February 1999)
- Administrative Procedures Act (5 U.S.C. 551-559, 701-706, and 801-808) as amended
- Antiquities Act of 1906 (16 U.S.C. 431-433)
- Bald Eagle Protection Act (16 U.S.C. 668-668d) as amended
- Federal Land Recreation Enhancement Act (REA), 16 U.S.C. 6803(c), Consolidated Appropriations Act (PL 108-447)
- Fish and Wildlife Act of 1956 (16 U.S.C. 742a-754j-2)
- Fish and Wildlife Conservation Act (16 U.S.C. 2901-2911) as amended
- Fish and Wildlife Improvement Act of 1978 (16 U.S.C. 7421)
- Migratory Bird Treaty Act (16 U.S.C. 703-712 as amended)
- National Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee) as amended
- Recreation Hunting Safety and Preservation Act of 1994 (16 U.S.C. 5201-5201)
- Refuge Recreation Act (16 U.S.C. 460K-460K-4) as amended
- Sikes Act (16 U.S.C. 670a-680o) as amended
- Soil and Water Conservation Act of 1977 (16 U.S.C. 2001-2009) as amended

Further, this EA reflects compliance with applicable State of Florida and local regulations, statutes, policies, and standards for conserving the environment and environmental resources such as water and air quality, endangered plants and animals, and cultural resources. To ensure compliance with the endangered species act, an intra-service section 7 consultation would be conducted for the proposed alternative. Following the consultation, a FONSI may be issued if no significant impacts are found on endangered species. The Service will consult archaeologists and the State Historic Preservation Office to ensure protection of cultural resources if the proposed action is implemented.

1.7 Public Involvement:

The Service began meeting with the Florida Fish and Wildlife Conservation Commission (FWC), which is the State agency responsible for fish and wildlife, in 2011 to discuss hunting opportunities in the proposed hunt area. Refuge staff and FWC staff have been coordinating on

the details of the proposed hunt since that initial meeting. The Service notified leaders of the Miccosukee, Seminole, Muscogee (Creek), and Poarch Band of Creeks on June 26, 2013 of the proposal, upcoming public meeting, and comment period. News releases were sent to notify the public on June 26, 2013, regarding the proposed deer and feral hog hunt on the Merritt Island National Wildlife Refuge. The public was invited to provide comments on the proposal by July 22, 2013 in order to be considered in the EA. A public scoping meeting was held on July 8th at the Mims/Scottsmeer Public Library. News releases about the public meeting and comment period were sent to over 1200 media outlets within the vicinity of the refuge. News releases were also sent to FWC, Canaveral National Seashore, and Kennedy Space Center Daily News. Approximately 1400 post cards with information about the public scoping meeting and comment period were mailed to the previous requesters of the CCP mailing list, CCP interest groups, refuge volunteers, and Merritt Island Wildlife Association members.

The release was subsequently covered by Brevard Times.com, *Florida Today* newspaper, and released to hundreds of media outlets by FWC. Forty-four written comments were received during the three-week public scoping period (June 26-July 22) and 68 people attended the public meeting.

1.7.1 Issues and Concerns:

Comments received during the meeting were supportive of the hunt and attendees were interested in expanding the proposed hunt either by acres, number of days, weapons used, or species allowed to take. Several questions were asked to clarify hunt details. Suggestions for the permit included: allow a guest permit, have a preference point system, and increase the cost of the permit to properly staff hunts. Opposing views included opposition to all hunting on refuges, concern for the safety of other visitors from stray bullets, and concern that increased access to the area would increase the chance of disturbance or accidental take of threatened or endangered species. Other concerns identified through public scoping included:

- The current hog trapping on the refuge would interfere with the hunting of hogs in the proposed area; prohibit hog trapping during or before the hunt.
- Have a deer management plan in place before establishing a hunt.
- The hunt plan should state what the huntable acres are versus acres on the map. In other words, show the area that can actually be hunted instead of all area within jurisdictional boundaries.
- There are so many places using tax payer money to trap hogs and not enough public hunts open.
- Give the hunt area a name like Shiloh or Hog City
- Need to clarify that this is a deer hunt with hogs as a bonus.
- In a state where less than 1% of the population purchases a hunting license, it is important to maximize our hunting opportunities.
- Hunting would be another way to enjoy a beautiful, well-managed refuge.
- Hunting deer and feral hogs can help keep them under control for a healthy population.
- Open it only to archery for safety reasons for the participants and visitors nearby. It would also be less disturbing and not push game out of the area.

- Expand the amount of days, acres, and weaponry to control hogs.
- The hunt will help prevent episodes of nuisance hogs for the residents around these areas.
- Permit use of a dog on a leash to track a wounded deer.
- Have check station to assess the hunt success after the first season.
- Don't allow crossbows during archery season, but have a separate crossbow season.
- Crossbows are useful for disabled persons.
- Allow crossbows within the archery hunt.
- Allow time for scouting.
- Have a special disabled hunt.
- Follow the FWC regulations on antler restrictions.
- The timing of introducing this hunt coincides with the proposed rocket launch facility at Shiloh, is this on purpose?
- Maintain the agreement with NASA for the control of feral hogs and there would be no need for hunting.

We have evaluated the comments and are incorporating the comments in the Environmental Assessment in the following ways: The Service is evaluating the maximum number of hunt days that Refuge staff could accommodate. The number of acres and species in the proposal is the maximum number the Refuge can accommodate at current staffing levels. Other alternative areas are discussed in section 2.3 - Alternatives Considered But Dismissed From Detailed Analysis. Additional species, acres, or weaponry may be evaluated at a later date if staffing levels increase. Regarding the timing of the proposal, the Service first proposed the upland hunt during public scoping for the CCP beginning in 2002. By 2006, the Draft CCP and the Compatibility Determination for the proposed upland hunt was released to the public for review and comment. The Compatibility Determination for the upland hunt is attached to this document in Appendix A. You may access the completed CCP at: <http://www.fws.gov/southeast/planning/CCP/MerrittIslandFinalPg.html>.

Hog trapping

The Service will not manage the hog population on the Refuge for hunt opportunities. However, to avoid conflict between users, the Refuge will prohibit hog trapping within the proposed hunt area during the hunt season. The Refuge does not intend to control hogs through the proposed hunt. It has been proven that trapping is more effective in the control of feral hogs than traditional hunting. The hog hunting opportunity is offered to meet the demand for increased hunting opportunities and augment current feral hog control methods.

Scouting

Scouting would be offered up to two days prior to the hunt. Hunters would be permitted to set up stands during this time and they must be removed the last day of the permitted hunt. Stands must be clearly marked with the hunter's permit number.

Management Plan

Some comments suggested the need for a deer management plan before establishing a hunt. There have been no formal surveys for deer on the Refuge; however, the proposed hunt is limited in number of days and permits to prevent detrimental impact to the deer population. The FWC has seen an increase of harvested deer for many decades and has found the habitat types in the proposed hunt area suitable for deer and could sustain a hunt (Florida Fish and Wildlife Conservation Commission 2007). The Refuge will follow hunt regulations set by the State and permitted hunt dates would be chosen within those dates set for Zone C which covers the proposed hunt area. The habitat and presence of wildlife on this property is similar to other hunted properties in the state that are managed by FWC. Although additional wildlife surveys are not contemplated at this time, conservative hunt formats and restrictive bag limits should provide sustainable populations of game species into the future. Harvest and hunter effort will be monitored at the check station.

Safety and Weapons

The public safety is a priority on the Refuge, the public concerns regarding high powered rifles and stray bullets are addressed by restricting the weapons allowed to archery only. The use of other primitive weapons will be evaluated based on safety considerations and feedback from the first season. The Service would follow FWC regulations concerning methods of take. Use of crossbows or other primitive weapons, if allowed, would require applicable permits from FWC. Roads and trails would be buffered from hunting activity to reduce public injury from stray projectiles.

2.0 ALTERNATIVES

2.1 Alternative A--No Action Alternative:

Under the No Action Alternative, current management direction would continue. Current waterfowl hunts would continue; however, no additional hunting would be established. Implementation of this alternative would not facilitate an additional wildlife-dependent priority use that has been found to be compatible with the purposes of the Refuge and the mission of the National Wildlife Refuge System. There would be no appreciable additional cost to the Refuge under this alternative. There would be no change to current public use and wildlife management programs on the Refuge. The current level of feral hogs would continue to be removed through trapping with no additional hogs being removed through hunting. Habitat conditions would continue to be negatively impacted at the current rate by an over-abundant population of feral hogs. Wildlife vehicle strikes would remain at current levels along SR 3.

2.2 Alternative B—*Upland Hunt* (Proposed Action Alternative):

The Service proposes to allow hunting for deer and feral hogs consistent with State laws and regulations on approximately 6,000 acres of upland habitat within Merritt Island National Wildlife Refuge on up to five 3-day weekends during the State deer season. During the first year of the hunt, we would allow 9 days of hunting over three 3-day weekends, one each month from September through November. Thereafter, we would determine whether to increase hunting up

to 15 days over five 3-day weekends from September through December based on Refuge staff availability and the health of the deer population. To ensure adequate parking and minimize potential conflicts among user groups, the upland hunt weekends would not coincide with waterfowl hunt weekends. Hunters would be allowed to enter the hunt area up to two days before the hunt for scouting. Therefore, during the permitted three day hunt, hunters may be in the hunt area for up to five days. Each year the Refuge would publish the specific hunt days, regulations, and open areas in the hunt brochure.

The hunt would be limited to 30 hunters per weekend and the quota permit would allow the hunter to hunt all 3 days of the permitted weekend. One youth (under 16) would be allowed to hunt, without obtaining a quota permit, while supervised by a permitted adult hunter. All hunters must obtain applicable State licenses, the appropriate Refuge quota permit for that weekend (unless youth under 16 supervised by a permitted adult), and a self-issuing Refuge permit located in the Refuge Hunt Brochure. The Refuge would follow regulations for deer bag limits and take, set by FWC, and would allow take of unlimited hogs.

The hunt would be limited to archery the first season, and then evaluated for use of other primitive weapons for future seasons. Refuge staff would evaluate the number of participants, safety, harvest success, and demand for use of other primitive weapons after the first year to make this determination. This EA will consider use of primitive weapons legally allowed by the FWC including, but not limited to: compound bows, crossbows, and muzzleloaders.

In 2008, a Compatibility Determination was completed for the upland hunt and included in the Refuge's CCP. The proposed hunt was found compatible with the following stipulations:

- Hunter densities and use levels will be relatively low during days the refuge is open to hunting.
- Sufficient restrictions have been established to ensure that an adequate amount of high-quality habitat would be available to accommodate the needs of deer and other wildlife using the refuge.
- Sufficient opportunities are available for other priority wildlife-dependent recreation during the upland hunt season.

The proposed hunt would meet these stipulations by keeping hunter densities low, no more than one hunter per 100 acres. The Service would consult with State and Federal biologists to ensure adequate huntable populations based on habitat and available science. The proposed hunt would not interfere with other waterfowl hunts and be held on separate days. Other public use opportunities would remain open and available during hunt days, and the Refuge would separate user groups by public use zones (Figure 3). Public use zones have been identified to ensure a quality visit for all user groups. The primary public use zone is located in an area referred to as the triangle (area formed by SR 402, SR 406, and SR 3). The triangle is a more intensive user area which is primarily non-consumptive uses, for example, wildlife observation and photography. The secondary zone has both non-consumptive and consumptive uses; however, has less intensive use. The secondary zone includes many popular fishing and hunting areas. The zones represent a natural separation of user groups present on the Refuge. The proposed

hunt area provides hunting opportunities in a less intensely used area of the Refuge and would provide a high quality experience for hunters.

The proposed hunt would meet Refuge goals of providing quality hunt opportunities and reducing the feral hog population. The Refuge has the needed staff and infrastructure to implement the proposed action, no additional resources are needed. Upland hunt days would not overlap with waterfowl hunt days to alleviate congestion. Parking is available along established Refuge roads and parking lots.

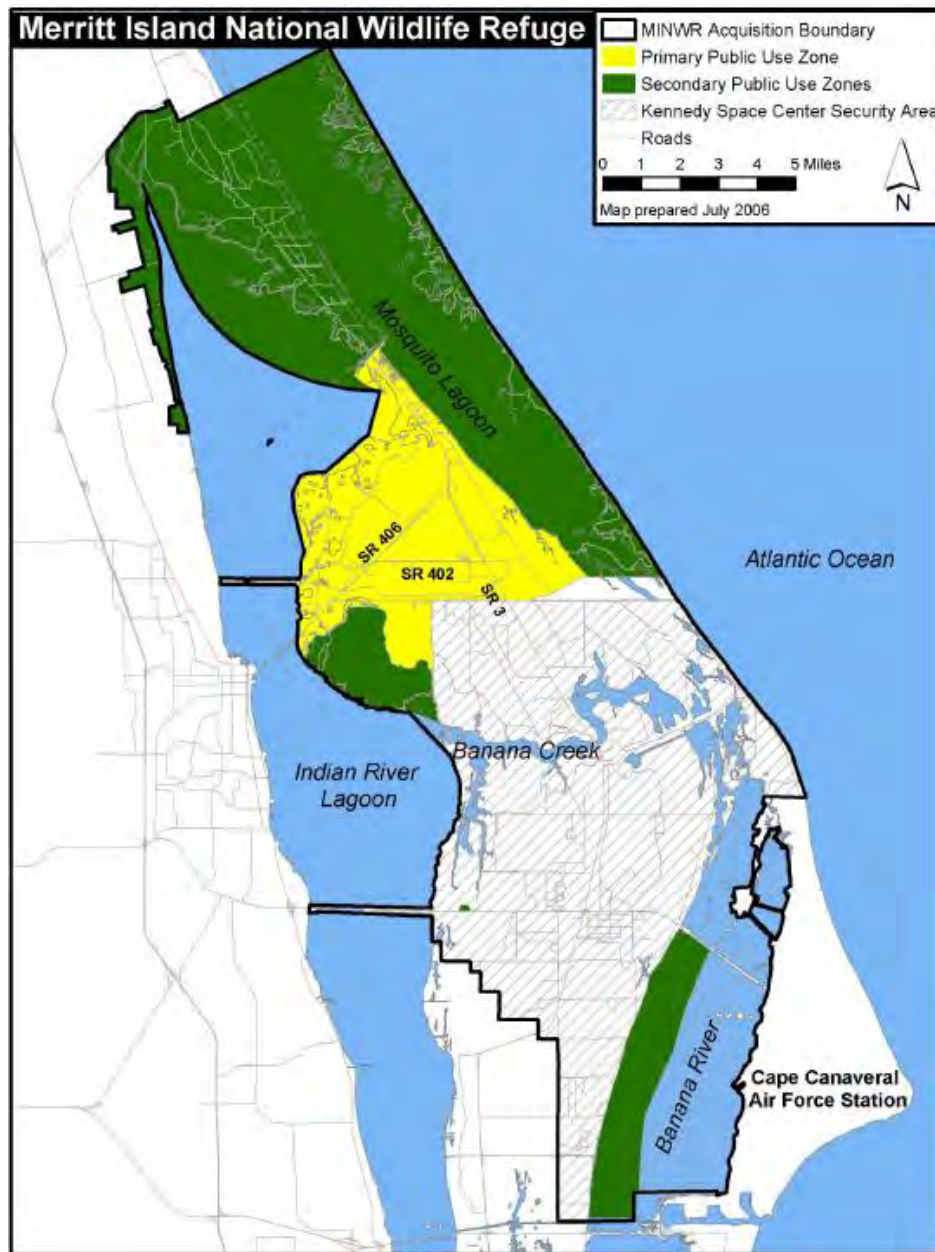


Figure 3. Public Use Zones identified on Merritt Island National Wildlife Refuge. Primary Use Zone has more intensive visitation. The Secondary Use Zone is less intensive and contains most of the fishing and hunting opportunities.

2.3 Alternatives Considered but Dismissed from Detailed Analysis:

The Service considered other alternative hunt areas to increase acres of the proposed hunt area after consideration of public comments suggesting acreage expansion. Although there are other areas on the Refuge with habitat to sustain a huntable deer population, the area selected for this proposal was chosen for 3 reasons. (1) The area is a safe distance away from the KSC security area, (2) the area is outside the Primary Use Zone which has intensive public use, and (3) the area is large enough to provide a quality sustainable deer hunt.

3.0 AFFECTED ENVIRONMENT

3.1 Physical Environment:

The Refuge derives its name from Merritt Island, which, along with Cape Canaveral, is a barrier island complex that formed during the Pleistocene and Holocene periods. The complex is one of the last extensive undeveloped barrier islands on the eastern coast of Florida. The island topography is near sea level and generally flat. The ridge and swale topography includes bands of wetlands and uplands orienting northeast to southwest. The proposed hunt area lies in the north central portion of the Refuge, north of the Haulover Canal which is part of the Intracoastal Waterway and connects the Mosquito Lagoon and Indian River Lagoon.

The main factors influencing the climate on the Refuge are latitude and the proximity of large bodies of water. Generally, the climate can be described as subtropical with short, mild winters and hot, humid summers, with no appreciable spring or fall seasons. Summer weather patterns usually begin in April and prevail for nine months. Summer temperatures (degrees F) range from the low 70s at dawn to the upper 80s and low 90s during the afternoon. Average temperatures during the winter range from lows in the 50s to highs near 75. As one would expect with the large bodies of water in and around the refuge, the relative humidity (RH) is typically high. The mean dawn RH is between 88 and 95 percent throughout the year, while readings in the mid-afternoon are between 55 and 67 percent. Rainfall typically occurs during two time periods separated by dry seasons. Between late May and early October, weather patterns are dominated by the effects of the Bermuda High. This system causes southeast winds that bring moist warm air onshore, leading to the formation of thunderstorms. These are short duration, high intensity localized storms. The refuge averages 83 thunderstorm days per year, with 60 percent of the annual precipitation occurring during these months. According to National Weather Service data, more than 22,000 lightning strikes occur in Brevard County each year.

Wind is another important weather condition that greatly impacts the refuge. Wind patterns change throughout the day due to such factors as sea breezes and erratic winds around thunderstorms. High winds, above 20 miles per hour at the 20-foot level, are common in the winter and spring months, with occasional days with 35 to 40 mph winds. High winds are also associated with tropical systems in the summer.

3.1.1 Air Quality

The air pollutants of major concern in Florida are carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter, and sulfur dioxide. The primary sources of these pollutants are vehicle emissions, power plants, and industrial activities. The Indian River Lagoon area is considered to have good air quality. However, occasional temperature inversions, lasting up to 48 hours, can temporarily degrade local air quality below acceptable levels.

The Refuge is considered an attainment or clean area under the Clean Air Act. The ambient air quality is influenced by NASA operations; land management practices, such as prescribed burning; vehicle traffic; and offsite emission sources. The daily air quality conditions are most influenced by the considerable onsite vehicle traffic, utilities fuels combustion (two regional power plants are within 10 miles of the refuge), NASA's refurbishment and maintenance operations, and incinerator operations. Space launches, training fires by the Kennedy Space Center Fire Department, prescribed burning, and wildfires on the refuge influence air quality as episodic events. Smoke from wildland fires can disrupt space center operations, such as launches, landings, and payload preparation.

3.2 Biological Environment:

Many of the vegetation types found on the proposed hunt area are dependent on periodic fires for their continued existence. Indigenous human populations and European settlers impacted the natural fire regime by setting fires to assist with hunting or agricultural activities. They also began to modify the physical landscape, starting with the construction of roads, drainage ditches, and canals. The use of the land for agriculture increased the construction of infrastructure, but major alterations to the landscape did not occur until the 1950s. During the next several decades, fire was excluded from the landscape. The vegetation on the land which is now the refuge became overgrown, reducing its utility for some native wildlife. Some of the land was converted to citrus groves. In the early 1960s, fragmentation of the land increased as the infrastructure for the John F. Kennedy Space Center was constructed.

3.2.1 Vegetative Communities:

Merritt Island NWR includes saline wetlands, freshwater wetlands, beach and dune, upland shrubland, wetland forest, upland forest, and nonnative vegetation. The proposed hunt area primarily contains forests and shrublands. Some areas are dominated by nonnative vegetation. Over 1,000 plants have been documented on the Refuge and were organized into vegetative communities.

Native Vegetative Communities

Cabbage Palm Hammock- (SABAL PALMETTO TEMPERATE FOREST ALLIANCE; Sabal palmetto Association): These hammocks are almost pure stands of cabbage palms (*Sabal palmetto*). The understory is usually open with a scattering of palmetto and other vegetation. Although cabbage palms can grow on soils with a wide range of moisture regimes, they are typically found on more or less saturated soils, such as those along the edges of impoundments.

As the soils become better drained, the vegetation grades into the mesic oak/palm hammocks. Cabbage palm hammocks can also be found on disturbed sites, land that was once cleared for home sites or for agriculture often times comes back as stands of exotics and cabbage palms when abandoned. This situation is especially noticeable in the case of citrus groves that have gone fallow. The proposed hunt area has fallow citrus groves.

Hardwood Hammock- (QUERCUS VIRGINIANA-SABAL PALMETTO FOREST ALLIANCE; Quercus virginiana-Sabal palmetto Association): These hammocks are dominated by large live oaks (*Quercus virginiana*), cabbage palms, and laurel oaks (*Q. laurifolia*). The understory in some of these hammocks is palmetto (*Sabal palmetto*), while others have a mix of subtropical shrubs, such as wild coffee (*Psychotria* spp.), nakedwood (*Myrcianthes fragrans*), *Ardisia* spp., and ferns, along with the palmetto.

Upland Hardwood Forest- (QUERCUS VIRGINIANA-SABAL PALMETTO FOREST ALLIANCE; Quercus virginiana-Sabal palmetto Association): Although classified the same as the hardwood hammocks, the upland hardwood forests occupy slightly better drained soils. These are mixed hammocks that have not only cabbage palms and live and laurel oaks, but also elms, ashes (*Fraxinus* spp.), red mulberries (*Morus rubra*), sugar berries (*Celtis laevigata*), and other overstory species. The understories may have nakedwood, wild coffee, and southern red cedar (*Juniperus virginiana* var. *siliciola*).

Planted Hardwoods- (QUERCUS VIRGINIANA-QUERCUS LAURIFOLIA FOREST ALLIANCE; Quercus virginiana-Quercus laurifolia Association): These stands were planted on old citrus groves in the northern portion of the refuge during 1991 and 1992. The original planting density was six feet within row spacing with 12 feet between rows. By 2004 the crowns have closed within the rows. The understory consists mainly of exotic grasses left over from the citrus operation.

Pine Flatwoods- (PINUS ELLIOTTI-SERENOA REPENS ALLIANCE; Pinus elliotti-Serenoa repens Association): The pine flatwoods forests and woodlands are generally found on the poorly drained spodosols of the Myakka-Eau Gallie-Immokalee soil association. The overstory consists of two species of pines. South Florida slash pine (*Pinus elliottii* var. *densa*) makes up the vast majority of the pine population. Pond pine (*P. serotina*) can be found in small stands on very wet areas. Pine stands range widely in stocking densities, age, and height. The understory of the pine flatwoods varies depending on the elevation of the site. Common to all flatwoods sites is saw palmetto. Additional understory species on the mesic sites can include wax myrtle (*Myrica cerifera*), gallberry (*Ilex glabra*), and *Lyonia* spp. As the soils become dryer with increased elevation, the gallberry and wax myrtle become fewer and sand live oak, myrtle oak, and Chapman's oak begin to appear. The higher flatwoods, with a high proportion of scrub oaks, are locally known as scrubby flatwoods.

Upland Coniferous Forests- (PINUS ELLIOTTII-SERENOA REPENS ALLIANCE; Pinus elliottii-Serenoa repens Association): The upland coniferous forest and woodlands occur on both the Myakka-Eau Gallie-Immokalee and the Canaveral-Palm Beach-Welaka soil associations. South Florida slash pine is the predominant tree species, but small patches of sand pine (*Pinus clausa*) are also found. Many of the sites occupied by these stands have been

disturbed in the past. The understory has many of the same species as is found in the flatwoods, including palmetto and *Lyonia*. Shrub species favoring drier soils are also found, including sand live oak, myrtle oak, and Chapman's oak. On the disturbed sites the understory shrub layer may be absent or scattered. These areas may also contain a number of exotic grasses and forbs.

Upland Coniferous/Hardwood Forests- (PINUS ELLIOTTII-QUERCUS VIRGINIANA FOREST ALLIANCE; Pinus elliotii-Quercus spp. Association): These stands can be found on the Copeland-Wabasso soil association, but at a slightly higher elevation. South Florida slash pine and live oak are the predominant overstory species. There may be other mesic hardwoods in the canopy, such as elms, ashes, red mulberries, and sugar berries.

Oak Scrub and Scrubby Flatwoods- (QUERCUS GEMINATA-QUERCUS MYRTIFOLIA-SERENOA REPENS SHRUBLAND ALLIANCE; Quercus geminata -Quercus myrtifolia-Serenoa repens Association): This community is found on the well-drained soils of the Paola-Pomello-Astatula soil association, which are located on the higher ridges of the refuge. The vegetation consists of palmetto (*Serenoa repens*), sand live oak (*Quercus geminata*), myrtle oak (*Q. myrtifolia*), and Chapman's oak (*Q. chapmanii*). As the elevation decreases towards palmetto, flatwoods, or swales, more mesic vegetation can be found. The species mix here would include gallberry (*Ilex glabra*) and various *Lyonia* species. This lower elevation species complex is also known as the scrubby flatwoods. Pines can be associated with both the true oak scrub and the scrubby flatwoods. Sand pine (*Pinus clausa*) is present on the dryer sites, while south Florida slash pine (*P. elliotii* var. *densa*) is found in the scrubby flatwoods. Fire is essential in maintaining both the vertical and horizontal structure of the oak scrub and scrubby flatwoods. Historically, fires ranged through oak scrub areas, keeping the oaks short. The stands were open in nature with numerous sandy openings. Pine stands, although always an important component of the landscape, were scattered and sparse. In the absence of fire during the 1960s and 1970s, the oaks and palmettos became tall dense thickets with no open areas. Pine stocking increased dramatically in some areas, effectively changing the landscape from shrubland to forest. Many of these overgrown oak scrub areas have been cut and burned over the past 15 years in an attempt to create a more natural landscape. In addition, pines densities have been reduced through commercial harvesting, burning, and using mechanical treatment. Although much success has resulted in recreating the vertical structure of oak scrub, persistent openings remain lacking in many areas.

Palmetto Scrub- (SERENOA REPENS-ILEX GLABRA-LYONIA SPP. SHRUBLAND ALLIANCE; Serenoa repens-Ilex glabra-Lyonia spp. Association): The palmetto scrub occurs on the soils of the Myakka-Eau Gallie-Immokalee soil association. The majority of the vegetation is palmetto, gallberry, wax myrtle (*Myrica cerifera*), and several species of *Lyonia*. In many instances, this type is found in close association with the oak scrub. There is no real definitive break between these two types, but rather a gradual progression from one to the other. As the elevation on the land rises, scrub oaks can be found mixed in with the palmetto scrub vegetation.

Nonnative Plant Communities

Citrus Groves- (CITRUS SPP. WOODLAND ALLIANCE; Citrus spp. Association): Various species of citrus were planted prior to the acquisition of the lands of the refuge by the

government for Kennedy Space Center. Some of these were located in the proposed hunt area and some *Citrus spp.* still linger.

Brazilian Pepper- (SCHINUS TEREBINTHIFOLIUS-MYRICA CERIFERA SHRUBLAND ALLIANCE, Schinus terebinthifolius-Myrica cerifera Association): Many disturbed areas, including dikes and abandoned facilities, have been invaded by Brazilian pepper and other exotics, along with native species, such as wax myrtle. These stands are thick, almost impenetrable thickets. There is little in the way of ground vegetation.

Australian Pine- (CASUARINA SPP. FOREST ALLIANCE, Casuarina spp. Association): Australian pine was planted around citrus groves and home sites as wind breaks. These are dense stands of Casuarina with little, if any, understory. The ground cover is almost exclusively needles and other debris from the trees.

3.2.2 Wildlife:

The proposed upland hunt area supports a variety of upland species. There are three federally listed wildlife species that regularly occur in the proposed hunt area, they include: Florida scrub-jay (*Aphelocoma coerulescens*), American alligator (*Alligator mississippiensis*), and eastern indigo snake (*Drymarchon corais couperi*). Three State Species of concern use the proposed hunt area, they include: Gopher tortoise (*Gopherus polyphemus*), Florida mouse (*Peromyscus floridanus*), and gopher frog (*Rana capito*). The bald eagle (*Haliaeetus leucocephalus*) is protected under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act.

Mammals

The refuge's mammalian fauna is characteristic of the central Florida coastal barrier ecosystem. Thirty species of mammals are known to occur on the refuge, including two marine mammals (the West Indian manatee and Atlantic bottlenose dolphin) which frequent lagoon and offshore waters. The refuge provides important habitat for two federally listed species, the West Indian manatee (state and federally listed as endangered) and the southeastern beach mouse (state and federally listed as threatened). No federally listed mammals are known to occur in the proposed hunt area.

There are harvestable and sustainable populations of white-tailed deer in the proposed hunt area. White-tailed deer are highly adaptable and can tolerate a variety of habitat changes. Deer need a nutritious year-round food supply to survive, and food availability limits the number of deer the habitat will support in a healthy condition. When a white-tailed deer population exceeds carrying capacity, they over-browse and destroy available desirable food supplies. Death, malnutrition, low body weights, poor fawn survival and losses from parasites and diseases can occur causing a decline in the population.

Feral hogs are an invasive nuisance species on the Refuge which causes physical, biological, and economic damage to the Refuge. Feral hogs are present in large numbers in all upland and marsh habitats and cause extensive habitat damage. Their rooting activity disturbs the soil and removes native vegetation, making these areas susceptible to exotic plant infestation. They negatively impact wildlife through direct mortality and competition for food. Hogs have been

documented destroying federally protected sea turtle nests sometimes causing complete mortality of unhatched eggs. Their rooting and foraging activities cause extensive damage to archaeological sites (Engeman et al., 2012).

Hogs are also a safety hazard due to impacts with vehicles and they cause economic damage through vehicle collisions and destruction of landscaped areas and road shoulders from rooting.

Birds

Avian species are a highly important refuge resource. To date, more than 300 species of birds (both resident and transient) have been identified using the refuge for nesting, roosting, feeding, or loafing. This includes seven species that are federally listed as Threatened or Endangered; 42 species federally listed as Birds of Conservation Concern; 11 species listed by the State of Florida as threatened or endangered; and 12 species listed by the State of Florida as Species of Special Concern. Of the seven avian species federally listed as Threatened or Endangered, two occur in the proposed hunt area: Florida scrub-jay and bald eagle.

3.2.3 Threatened and Endangered Species and Other Special Status Species

Florida Scrub-jay

The Florida scrub-jay is endemic to Florida and listed as Threatened under the Endangered Species Act in 1987. The refuge serves as an important site for the recovery of the Florida scrub-jay. The species was listed in response to range wide population declines resulting from habitat conversion and fragmentation caused by agricultural and urban development and the degradation of undeveloped habitat as a result of fire suppression and exclusion. The Refuge supports one of the largest populations of Florida scrub-jays in the state and is of critical importance to the long term survival of the species. Scrub-jays can be found in the proposed hunt area and part of the area is used as a Scrub Reserve Unit. This unit is occupied by 31 scrub-jay families. Population size of the Florida scrub-jay is influenced by the amount of available habitat and habitat suitability.

American Alligator

The American alligator is federally listed as threatened only as a result of its similarity in appearance to the federally endangered American crocodile. The species is not regulated under Section 7 of the Endangered Species Act and is not in danger of becoming extinct. American alligators are abundant on the refuge, with an estimated population of over 3,000 individuals.

Eastern Indigo Snake

The eastern indigo snake is listed as threatened under the Endangered Species Act and uses diverse habitats such as pine flatwoods and scrubby flatwoods, which are found in the proposed hunt area. The Refuge has documented indigo snakes within the proposed hunt area.

Bald Eagles

While no longer listed under the ESA, bald eagles are still protected under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. While bald eagles are known to occupy the Refuge year round, they are most abundant during the winter months when breeding pairs, non-breeding adults and sub-adults are known to be present. The proposed hunt area contains nine bald eagle nesting territories.

Gopher Tortoise

The current federal status of the gopher tortoise is a “Candidate” for listing for populations east of the Mobile and Tombigbee Rivers in Alabama, Georgia, Florida, and South Carolina. Candidates are those species that the Service has determined warrant listing, but are precluded due to lack of resources and higher listing priorities. Candidate species must be treated as protected species on Service lands including MINWR. Surveys conducted in 2013 estimated MINWR gopher tortoise population at 3,000-5,000 tortoises. Gopher tortoises are present in the proposed hunt area.

Protection of gopher tortoises on MINWR is particularly important due to its high ecological value as a keystone species, which means many other wildlife species benefit from its presence and abundance within the ecosystem. More than 300 other species have been known to use gopher tortoise burrows. These include Federally and State protected species such as the Eastern indigo snake, pine snake, and gopher frog.

The regular application of prescribed burning is critical for the maintenance of habitat conditions preferred by the gopher tortoise. Prescribed burning reduces shrub and hardwood encroachment, and stimulates growth of tortoise forage plants such as grasses, forbs, and legumes. This allows greater sunlight penetration to reach ground level, which promotes establishment of understory species used by the tortoise as forage. Fire also promotes conditions necessary for gopher tortoise egg incubation.

Florida Mouse

The Florida mouse is endemic to peninsular Florida and listed by the FWC as a Species of Special Concern. Currently it is not listed federally, nor is it a candidate for listing. The Florida mouse occupies fire maintained xeric uplands with well drained soils. On the Refuge, it shares similar habitats with the Florida scrub-jay, and can occur commensally with gopher tortoises. While the species has been documented on the Refuge (as part of other small mammal surveys) no systematic survey for the species has ever been attempted. As a result, the abundance and distribution of the species on MINWR is unknown. It is likely to occur in the proposed hunt area commensal with gopher tortoises.

Gopher Frog

The gopher frog is listed as a Species of Special Concern (68A-27.005, F.A.C.) by FWC. The presence of gopher frogs is closely linked to the presence of gopher tortoises, and this species relies extensively on gopher tortoise burrows for shelter and, to some degree, food.

Florida Pine Snake

The Florida pine snake is listed as a Species of Special Concern (68A-27.005, F.A.C.) by FWC. Florida pine snakes occupy relatively large, unfragmented blocks of fire-maintained, open canopy, xeric habitats including sandhill, old fields, pastures, sand pine scrub, and scrubby flatwoods. In addition to the habitat itself, stump holes, active and inactive gopher tortoise burrows, and pocket gopher mounds and burrows are necessary to ensure adequate underground refugia (areas for protection or feeding) for the Florida pine snake.

3.3 Human Environment:

3.3.1 Cultural Resources:

One of the goals of the Refuge is to preserve, investigate, and interpret the archaeological and historical resources of the refuge exemplifying the natural and cultural history of coastal Florida and the north Indian River Lagoon system. Over much of the refuge, cultural resources are protected by the Kennedy Space Center, Canaveral National Seashore, and/or the Refuge. Cultural resources on federal lands are protected under several environmental and historic preservation laws, Executive Orders, and agency policy. In the overlap area with Canaveral National Seashore, the National Park Service takes the lead in managing cultural resources. NASA takes the lead in the operational areas of Kennedy Space Center. Outside of these areas, the refuge is the lead agency for cultural resource protection.

The U.S. Fish and Wildlife Service, like other federal agencies, are legally mandated to inventory, assess, and protect cultural resources located on those lands that the agency owns, manages, or controls. The Service's cultural resource policy is delineated in 614 FW 1-5 and 126 FW 1-3. In the Service's Southeast Region, the cultural resource review and compliance process is initiated by contacting the Regional Historic Preservation Officer/Regional Archaeologist (RHPO/RA). The RHPO/RA will determine whether the proposed undertaking has the potential to impact cultural resources, identify the "area of potential effect," determine the appropriate level of scientific investigation necessary to ensure legal compliance, and initiates consultation with the pertinent State Historic Preservation Office (SHPO) and federally recognized Tribes.

Cultural resources, historic properties, and associated cultural landscapes are located in the Ross Hammock and Shiloh areas, such as the Elliott Plantation Complex, the Ross Hammock Complex, the Griffis Place Burial Mound, the "Confederate" Salt Works, homesteads associated with Spanish land grants from the Second Spanish period (1784 A.D. -1820 A.D.), and four early 20th century historic cemetery plots. Associated with the Elliott Plantation Complex are several cultural landscapes tied to the late 18th century sugar agricultural plantation system and the late 18th – 19th century African and African American worlds. The Elliott Plantation Complex and its associated landscapes are eligible for the National Register of Historic Places and as a National Historic Landmark. It is the southernmost and earliest intact sugar plantation in North America.

A number of National Register-listed or eligible pre-Columbian shell mounds and earthen burial mounds are present in the vicinity of the proposed hunt area. These sites include Seminole Rest,

Turtle Mound, Castle Windy, Max Hoeck Burial Mound, and Bill's Hill Burial Mound.

The recorded historic properties have cultural and religious significance to the Seminole Tribe of Florida, the Seminole Nation of Oklahoma, the Miccosukee Tribe of Indians, the Muscogee (Creek) Nation, and the Poarch Band of Creeks. Consultation with these Tribes will be carried out as part of the compliance with both NEPA and the NHPA, as well as meeting the federal government's obligations to consult pursuant to *Executive Order 13175: Consultation and Coordination with Indian Tribal Governments*; *Secretarial Order 3206: American Indian Tribal Rights, and Federal-Tribal Trust Responsibilities and the Endangered Species Act*; and tribal consultation policy.

3.3.2 Socioeconomic Resources:

The Refuge is located approximately 5 miles east of Titusville, Florida, with a population of 40,000 (US Census 2010). Orlando, Florida is 50 miles west of the Refuge with a population of approximately 250,000 (US Census 2010). The dominate land uses in the vicinity of the refuge is urban and the economy is highly influenced by operations at KSC. The City of Titusville, directly adjacent to the Refuge has a heavy economic reliance on KSC and related businesses. KSC is the largest single employer in the area of the Refuge. The space shuttle program ended in 2011, eliminating 9,000 jobs in the area.

The Titusville Chamber of Commerce lists the refuge as one of the area's main attractions. The Refuge also plays a role in the local economy as refuge employees typically live in the community, own property and support local businesses through routine purchases. A visitor use study conducted in 2010/2011 indicated that most visitors came to the Refuge multiple times per year and that 37% of visitors were from the local area (within 50 miles of the Refuge), whereas 63% were nonlocal. For most local visitors (81%), the Refuge was the primary purpose or sole destination of their trip. Nonlocal visitors stayed in the area, on average, for six days and spent an average of \$91/person/day in the local area, while local visitors spent an average of \$52/person/day in the local area.

3.3.3 Public Use/Recreation:

The Refuge averages about 1 million visitors per year. Most visitors conduct wildlife observation or photography. Approximately 200,000-300,000 visitors utilize the northern portion of the Refuge, including the proposed hunt area each year. Most visitors in the proposed hunt area are anglers and hunters. Public use areas north of Haulover Canal include waterfowl hunt areas, two boat ramps, the Manatee Observation Deck, Pine Flatwoods hiking trail, Shiloh Marsh Trail, and approximately 20,000 acres of navigable estuarine waters under Federal control. The Mosquito Lagoon supports multi-million dollar recreational and commercial fisheries and is one of the most popular fishing areas in Central Florida. Visitors are allowed to fish, crab, clam, oyster and shrimp the Indian River Lagoon and Mosquito Lagoon. Waterfowl hunting has a long tradition on the Refuge and has been permitted since 1964. The waterfowl hunting program includes approximately 36,000 acres of the Refuge. In 2012, over 5,000 hunt visits occurred on the Refuge.

4.0 ENVIRONMENTAL CONSEQUENCES

This chapter analyzes and discusses the potential environmental effects or consequences that can reasonably be expected by the implementation of the proposed action. An analysis of the effects of management action has been conducted on the physical environment, biological environment, and socioeconomic environment. The direct, indirect, and cumulative impacts of each alternative are considered. Direct effects are the impacts that would be caused by the proposed action at the same time and place as the triggering action. Indirect effects are impacts that occur later in time or distance from the triggering action. Cumulative effects are incremental impacts resulting from other past, present, and reasonably foreseeable future actions, including those taken by federal and non-federal agencies, as well as undertaken by private individuals. Cumulative impacts may result from singularly minor but collectively significant actions taking place over a period of time.

4.1 Physical Environment:

4.1.1 Impacts on Air Quality:

Alternative A--No Action Alternative:

There would be no impact to Air Quality under the No Action Alternative.

Alternative B--Proposed Action:

The proposed action may result in some short-term negative impacts at a local scale, as a result of increased vehicular traffic in the area. Temporary impacts to air quality from emissions produced by vehicles would be minimal and would be undetectable shortly after the vehicles were parked or exited the area.

4.2 Biological Environment:

4.2.1 Impacts on Habitat:

Alternative A--No Action Alternative:

Impacts to habitat are expected to remain the same from continuation of current management.

Alternative B--Proposed Action:

This alternative would have possible short-term impacts on individual plants from hunters walking to and from hunt sites. Foot travel is expected to have minor impacts because of low hunter densities (1 hunter/100 acres). Hunters would not be permitted to manipulate vegetation or clear trails. Parking would only be permitted on established parking areas and roadsides. All-terrain vehicles are not permitted.

The reduction of white-tailed deer and feral hogs could have a positive cumulative impact on vegetation and habitat over time due to a decrease in the number of animals rooting and

browsing. Any reduction in the number of feral hogs on the refuge is considered beneficial because of the negative effects of rooting and wallowing.

4.2.2 Impacts on Wildlife:

Alternative A--No Action Alternative:

Under the No Action Alternative, the existing habitat conditions would be maintained. There would be no change in diversity or abundance of wildlife that use the area.

Alternative B--Proposed Action:

The proposed action is not expected to adversely affect the white-tailed deer population. Direct mortality is expected; however, low hunter densities and the low number of hunt days (maximum 15 days) would not adversely affect the population of white-tailed deer on the Refuge.

Direct mortality to hogs is expected; however, the removal of hogs through hunting is not expected to reduce the population of hogs enough to control the population on the Refuge. Hunting is an ineffective population control method. The Refuge would continue utilizing trapping programs to reduce the feral hog population and reduce hogs in problem areas.

Non-game species would be temporarily disturbed by hunters in the area. This impact is expected to be short-term and negligible to the species.

4.2.3 Impacts on Threatened and Endangered Species and Special Status Species:

Alternative A--No Action Alternative:

Under the No Action Alternative, the existing habitat conditions would continue to be impacted by rooting from feral hogs. The impacts would remain the same for Threatened and Endangered species and special status species.

Alternative B--Proposed Action:

Eastern indigo snakes and Florida pine snakes are particularly vulnerable to mortality from motor vehicles. Any increase in motor vehicle traffic in the Shiloh area would have a negative effect on these snakes. The proposed hunt would be limited to up to 15 days of hunting and up to 10 days of scouting by up to 60 hunters per day. The traffic increase is negligible; however, any loss of Eastern indigo or Florida pine snake would be negative for the species.

Disturbance and take of bald eagles, eagle parts, or nesting materials is prohibited under the Bald and Golden Eagle Protection Act. Refuge Law Enforcement would need to spend more time patrolling known nesting areas during hunt weekends to prevent violations.

The proposed action could have negative impacts to other listed species through accidental take or disturbance. Limiting the hunt to archery or primitive weapons only would help prevent any accidental take of federally listed species or State Species of Concern.

4.3 Human Environment:

4.3.1 Impacts on Cultural Resources:

Alternative A--No Action Alternative:

This alternative has the least direct impacts to cultural resources. Under this alternative, there are no anticipated direct or indirect impacts to the cultural environment, as current conditions would be maintained, and no ground disturbance would occur.

Alternative B--Proposed Action:

Under the Proposed Action Alternative, negative impacts could occur to cultural resources, if hunters removed or disturbed artifacts and/or vandalized above-ground architectural ruins. Like the No Action Alternative, there are no anticipated direct or indirect impacts to historic properties as no ground disturbing actions will occur and current ecological conditions will be maintained. Refuge Law Enforcement would patrol these areas to look for violations.

4.3.2 Impacts on Socioeconomics

Alternative A--No Action Alternative:

The economic and social condition of the area would remain the same.

Alternative B--Proposed Action:

The proposed action would have a positive impact on the local economy through an increase in sales of hunting supplies and increased visitation to the area.

4.3.3 Impacts on Public Use/Recreation:

Alternative A--No Action Alternative:

No new hunting opportunities would be offered to the public.

Alternative B--Proposed Action:

Wildlife dependent recreation would slightly improve under the proposed action alternative. More lands would potentially be available to the public for hunting.

4.4 Assessment of Cumulative Impacts:

A cumulative impact is defined as an impact on the environment that results from the incremental impact of the proposed action when added to other past, present, and reasonably foreseeable future action regardless of what agency (federal or nonfederal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7).

Cumulative impacts are the overall, net effects on a resource that arise from multiple actions. Impacts can “accumulate” spatially, when different actions affect different areas of the same resource. They can also accumulate over the course of time, from actions in the past, the present, and the future. Occasionally, different actions counterbalance one another, partially cancelling out each other’s effects on a resource. But more typically, multiple effects add up, with each additional action contributing an incremental impact on the resource.

4.4.1 Anticipated Direct and Indirect Impacts of the Proposed Action on Wildlife Species

Feral Hogs

Overpopulations of feral hogs, an exotic animal species, have resulted in widespread habitat impacts on the refuge. Feral hogs uproot vegetation, disrupt habitat, and create potential locations for the establishment and spread of exotic plants. The refuge has an active hog control program utilizing trappers. The trapping program annually removes an average of 2000 feral hogs. Trapping is the most cost effective method of controlling hogs. The primary intentions of feral hog hunts are to augment the trapping program and assist in the population control of this unwanted species. Injury and direct mortality of hogs is expected as well as short-term changes in hog distribution and abundance. Recreational hunting of hogs is not anticipated to have long-term significant impacts on the hog population. A positive impact to the public is expected based on the local demand for increased hunting on the Refuge. Any removal of these destructive animals would have a positive impact to the Refuge and neighboring habitat. Also, a reduction in vehicle strikes involving hogs is anticipated along SR 3 near the proposed hunt area.

Executive Order 13112, Invasive species, issued in February, 1999 instructs Federal Agencies to: prevent the introduction of invasive species; detect and respond rapidly to and control populations of such species in a cost-effective and environmentally sound manner; monitor invasive species populations accurately and reliably; provide for restoration of native species and habitat conditions in ecosystems that have been invaded; conduct research on invasive species and develop technologies to prevent introduction and provide for environmentally sound control of invasive species; and promote public education on invasive species and the means to address them.

Deer

Hunting intensity can influence habitat use for highly mobile wildlife species such as deer, which could move away from an area of heavy disturbance. Disturbance impacts associated with upland hunting would be seasonal. Injury and direct mortality is expected as well as short-term changes in deer distribution and abundance. Direct mortality can impact isolated, resident deer populations by reducing breeding populations to a point where the isolated population can no longer be sustained; however, this is not anticipated.

White-tailed deer harvest in Florida typically exceeds 100,000 animals per year. Deer are the most popular species hunted in the state (Florida Fish and Wildlife Conservation Commission 2007). Direct deer mortality is expected; however, negative long-term effects to the local deer

population are not expected if the proposed alternative is implemented. The timing, duration and anticipated harvest levels of the Refuge's hunt program would not result in adverse cumulative impacts to Refuge resources, wildlife populations or the surrounding environment. Under the proposed action alternative the impacts are expected to be unchanged. Refuge staff would monitor harvest rates through a deer check system and restrict harvest if needed to ensure a sustainable deer population for future hunts.

4.4.1.1 Migratory Species

The proposed hunt would have no effect on migratory species. The Refuge currently offers a limited quota waterfowl hunt congruent with federal and state laws and regulations.

4.4.1.2 Endangered Species

It is the policy of the Service to protect and preserve all native species of fish, wildlife, and plants, including their habitats, which are designated as threatened or endangered with extinction.

Regional Analysis

A Section 7 consultation would be initiated with the Jacksonville Ecological Services Office with the proposed action of offering upland deer and feral hog hunting on 6,000 acres on the Refuge.

Local Analysis

Current management is not likely to have adverse impacts to Florida scrub-jay, eastern indigo snakes, or American alligator. The proposed action may have minor direct impacts to Florida scrub-jay from disturbance. Eastern indigo snakes are vulnerable to vehicle strikes and any increase in traffic on the Refuge would have a negative impact to this species. There is a very minor risk for an increase in vehicle strikes due to the low number of hunters and hunt days allowed in the proposed hunt.

4.4.2 Anticipated Direct and Indirect Impacts of Proposed Action on Refuge Programs, Facilities, and Cultural Resources.

4.4.2.1 Other Wildlife-Dependent Recreation

The Refuge has other wildlife-dependent recreational opportunities in or around the proposed hunt area that could be affected by the hunt program. Before the hunt, the Refuge would notify the public through displaying signs or notices in the hunt area. The hunt could temporarily interfere with wildlife observation and photography through disturbance. Generally, many of these non-hunting activities do not occur frequently in the proposed hunt area, as they are more often in the primary public use zone which is outside the proposed hunt area. These conflicts are temporary and short-term.

By implementing the Proposed Action Alternative B, the Refuge would meet the demands of the public, as well as, meeting the goals for which the Refuge was established. Implementing this

hunt program would bring a new public hunt opportunity to an area with a demand for increased hunting opportunities. This is especially important as nation-wide statistics show a decrease in hunter retention and recruitment (especially youth hunters); in part due to a lack of quality public hunting areas.

As public use levels expand across time, the potential for unanticipated conflicts among and with user groups may be present. Deer hunters could use tree stands, which elevates the hunter and would allow projectiles to travel further, but with the low amount of visitor activities in this area and the types of weaponry to be allowed, the risk of public injury would be minimal. In the event such unanticipated conflicts may occur as a result of implementing this hunt program, the Refuge's visitor use programs would be adjusted as needed to eliminate or minimize each problem, so that it could continue to provide quality wildlife-dependent recreational opportunities. Hunting season dates and regulations would be set and regulated to allow all user groups to experience a quality visit while on the Refuge. The Refuge would have the flexibility to modify the hunt program in order to meet the needs of most wildlife-dependent recreational user groups.

4.4.2.2 Refuge Facilities

The Service defines facilities as: "Real property that serves a particular function(s) such as buildings, roads, utilities, water control structures, raceways, etc."

Under the proposed action those facilities most utilized by hunters would be: interior service roads, hunter check station, and trails. The Refuge would need to construct and maintain a small kiosk to serve as a hunter check station and provide information. The cost of building and maintaining the kiosk would be negligible. Roads and other facilities are currently used to accommodate Refuge management operations and other visitors. The addition of these limited hunts will slightly increase vehicular traffic; however, impacts on these facilities would be minor in the short term and over time. Any negative impacts realized to these facilities would be reduced by appropriate regulations.

The proposed opening of an additional hunt will provide an important role in carrying out the mission of the Service and the Refuge System. These same areas will be used by the other Refuge visitors during non-hunting periods.

4.4.2.3 Cultural Resources

Hunting, regardless of method or species targeted, is a consumptive activity that does not pose any threat to historic properties on and/or near the Refuge. The Refuge's existing infrastructure, such as roads, parking lots, and trails, has been deemed sufficient. New infrastructure development, which would trigger Section 106 and subsequent consultation with the SHPO and the Tribes, is not planned. In fact, hunting meets only one of the two criteria used to identify an "undertaking" that triggers a federal agency's need to comply with Section 106 of the National Historic Preservation Act. These criteria, which are delineated in 36 CFR Part 800, state:

1. An undertaking is any project, activity, or program that can alter the character or use of an archaeological or historic site located within the “area of potential effect;” and
2. The project, activity, or program must also be either funded, sponsored, performed, licenses, or have received assistance from the agency.

Consultation with the pertinent State Historic Preservation Office and federally recognized Tribes is, therefore, not required. Should additional infrastructure or facilities become necessary, then the FWS will consult with the SHPO and the Tribes pursuant to Section 106. Should hunters and/or Refuge Law Enforcement report a previously unidentified historic property or human skeletal remains, the FWS will notify the SHPO and the Tribes according to the Refuge’s Unanticipated Site Discovery Plan.

4.4.3 Anticipated Impacts of Proposed Hunt on Refuge Environment and Community

4.4.3.1 Refuge Environment

Negative impacts to the Refuge environment associated with the proposed hunting activities will be minor. It is expected that some minor disturbance to vegetation will occur as a result of people engaging in the proposed hunting activities. Air quality will experience minor impacts due to increased fossil fuel emissions as people travel to and from hunting areas. State Road 3, which runs between the proposed hunt lands is used frequently by Refuge visitors and KSC employees. The increased traffic from limited hunts is not likely to cause disturbance or affect the character of the Refuge. No additional roads will be open for this hunt, so vegetation impacts would be light and impacts would be contained to foot traffic. Additional staff time needed to administer the program include federal wildlife officers, biologists, and refuge rangers. Over time, hunters will become more educated and likely follow hunt regulations eventually needing less guidance from staff. Funds would be expended to develop associated permits, refuge hunt brochures, and signs. The refuge would be participating in the state quota hunt program resulting in additional recreational fee revenue.

Any negative cumulative impacts realized in the future action to the Refuge environment would be further reduced by appropriate regulation(s). Collectively, these actions are anticipated to result in minor cumulative effects to the Refuge environment.

4.4.3.2 Refuge Community

The economic impact of the proposed hunt program would be a relatively minor increase in sales of hunting licenses, ammunition, and other hunting accessories to the limited number of people participating in these hunts. Local hotels and restaurants may experience a slight increase in business as drawn hunters might utilize them.

The new hunts would result in a gain of public hunting opportunities in Florida, a region dominated by development, which would have a beneficial impact on the general public and hunter retention/recruitment. The community would also benefit from a slight increase in tourism and revenue.

4.4.4 Other Past, Present, Proposed and Reasonably Foreseeable Hunts (and Other Activities) and Anticipated Impacts

Past

Virtually all the lands managed by the Service as Merritt Island NWR were hunted before NASA acquired the land from private individuals and hunting clubs. During this time, hunting was not well regulated and some species were in danger of extirpation.

Present

The Refuge has and continues to work in cooperation with FWC biologists and staff in an ongoing effort to establish hunt regulations to maintain a sustainable deer population on the Refuge. Current Refuge hunts are very well controlled by number of hunters, season lengths, weapons allowed, and law enforcement presence. The State and Federal regulations on hunting create a sustainable hunting population with a positive affect to non-target species through protection.

Future

The proposed opening of additional units to big game on the Refuge is expected to be an effective management tool ensuring healthy and sustainable game animal populations, while decreasing feral hog numbers. Refuge staff will continue to promote native flora and fauna diversity through active habitat management that achieve Refuge wildlife habitat priorities and objectives. However, these goals and objectives may not be obtained if additional areas are not hunted. Deer and hog populations would subsequently increase beyond the habitat's carrying capacity and ultimately decreasing the biological integrity of the Refuge.

As public use levels expand across time, the potential for unanticipated conflicts among and with user groups may be present on the Refuge. In the event such unanticipated conflicts may occur as a result of expanding this hunt program, the Refuge's visitor use programs would be adjusted as needed to eliminate or minimize each problem, so that it could continue to provide quality wildlife-dependent recreational opportunities. Hunting season dates and regulations would be set and regulated to allow most user groups to experience a quality visit while on the Refuge. The Refuge would have the flexibility to modify the hunt program in order to meet the needs of all wildlife-dependent recreational user groups. It is assumed that more visitors to this area will create the potential for beneficial economic effects and a positive image for the county and surrounding area.

4.5.5 Anticipated Impacts if Individual Hunts are Allowed to Accumulate

The Service has concluded that there will be minor cumulative impacts on the Refuge's wildlife populations, either hunted or non-hunted species. The Service has also concluded that the proposed action will not cumulatively impact the Refuge environment or Refuge programs. This determination was based upon a careful analysis of potential environmental impacts of hunting on the Refuge together with other projects and/or actions. Hunting is an appropriate wildlife management tool that can be used to manage wildlife populations. Some wildlife disturbance

will occur during the limited hunting seasons. Proper zoning, regulations, and Refuge seasons will be designated to minimize any negative impacts to wildlife populations using the Refuge.

Field checks by Refuge law enforcement officers will be planned, conducted, and coordinated with staff and other agencies to maintain compliance with regulations and assess species populations and numbers harvested.

4.5 Environmental Justice:

Executive Order 12898 (Federal Actions to Address Environmental Justice in Minority and Low-Income Populations; February 11, 1994) was designed to focus the attention of Federal Agencies on the environmental and human health conditions of minority and low-income populations, with the goal of achieving environmental protection for all communities. The order directed federal agencies to develop environmental justice strategies to aid in identifying and addressing disproportionately high and adverse human health and environmental effects of their programs, policies, and activities on minority and low-income populations. The order is intended to promote nondiscrimination in federal programs substantially affecting human health and the environment, and to provide minority and low income communities with access to public information and opportunities for participation in matters related to human health and the environment.

None of the alternatives described in this EA will disproportionately place any adverse environmental, economic, social or health impacts on minority and low income populations. Implementation of the proposed action is anticipated to benefit the environment and people in the surrounding communities.

4.6 Indian Trust Assets:

No Indian Trust Assets have been identified in the proposed hunt area north of Haulover Canal. There are no reservations or ceded lands present. Because resources are not believed to be present, no impacts are anticipated to result from implementation of either alternative described in the Environmental Assessment.

4.7 Unavoidable Adverse Effects

As proposed under Alternative B, the implementation of deer and feral hog hunting on the refuge may result in some unavoidable adverse impacts. Some deer and hogs would be killed; however, deer and hogs are a renewable resource and there would be no discernible effect on the deer and feral hog population on the Refuge. There would also be some short-term disturbance to other resident wildlife, but these impacts are expected to be minimal.

4.8 Irreversible and Irretrievable Commitment of Resources:

None of the alternatives would result in a commitment of nonrenewable resources.

4.9 Table 1 - Summary of Environmental Effects by Alternative:

Environmental Resource	Alternative A: Current Management	Alternative B: Proposed Action
Impacts to Air Quality	Minor vehicle emissions and stirring of road dust expected	Same as alternative A with minor increase with hunting activities
Impacts on Habitat	No impacts, upland areas are currently closed to public access.	Minor direct positive by lowering populations of deer and hog. Minor direct negative impact to individual plants from trampling by hunters.
Impacts on Resident Wildlife	Currently, there is minor direct negative effect from disturbance by visitors on trails, boat ramps, or waterfowl hunters near the proposed hunt area. The proposed hunt areas are currently closed to the public.	Minor direct negative effect (some disturbance and harvest); Minor direct positive effect (management of deer herd and exotic feral hog removal)
Impacts to Migratory Species	No change, current waterfowl hunt brings minor direct negative effect (some disturbance and harvest).	Same as alternative A with Minor direct positive effect (management of deer herd and exotic feral hog)
Impacts on Threatened and Endangered Species	No impacts, the upland areas are closed to the public.	Minor direct negative effect from disturbance to Florida scrub-jay.
Impacts on Historic Properties/Cultural Resources	Minor direct negative effect (feral hog disturbance), though extent of negative effect is lessened by trapping program.	Direct positive effect (management of deer herd and feral hog removal); No impacts from hunting
Impacts on Socioeconomic Resources	No change	Minor direct/indirect positive effect (opening areas previously closed to the public)
Impacts to Visitor Service/Recreation	No change	Minor positive effect (opening areas to hunting).
Impacts on Public Health and Safety	No change, waterfowl hunting carries minor risks.	Minor risk (minimized by limiting number of hunters and use of primitive weapons)
Impacts of Refuge Facilities	No change	Minor direct negative effect from traffic increase on Refuge roads.

5.0 CONSULTATION, COORDINATION AND DOCUMENT PREPARATION

Document prepared by Refuge Staff, Merritt Island National Wildlife Refuge, U.S. Fish and Wildlife Service, Titusville, Florida.

5.1 Agencies and individuals consulted in the preparation of this document include:

- Florida Fish and Wildlife Conservation Commission
- U.S. Fish and Wildlife Service, Ecological Services

5.2 References

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Appendix

Compatibility Determination

for

Upland Hunt on Merritt Island National Wildlife Refuge

The Upland Hunting Compatibility Determination was excerpted and reprinted here from the Merritt Island National Wildlife Refuge CCP (2007)

Merritt Island National Wildlife Refuge Compatibility Determinations

The Fish and Wildlife Service reviewed several uses for compatibility during the comprehensive planning process for Merritt Island National Wildlife Refuge. Descriptions and anticipated impacts of each of these uses are addressed separately. However, the Uses through Other Applicable Laws, Regulations and Policies sections, the Literature Cited section, the Public Review and Comment section, and the Approval of Compatibility Determinations section apply to each use. If one of these uses is considered outside of the Comprehensive Conservation Plan for Merritt Island National Wildlife Refuge, then those sections become part of that compatibility determination.

Uses

Several uses were evaluated to determine their compatibility with the mission of the Refuge System and the purposes of the refuge: (1) waterfowl hunting; (2) upland game hunting; (3) fishing; (4) wildlife observation and photography; (5) environmental education and interpretation; (6) bicycling; (7) commercial services; (8) commercial fishing; (9) beekeeping; (10) research; (11) astronomy; (12) organized group camping; (13) noncommercial plant collection; (14) interim management of citrus groves; (15) feral hog control; and (16) forest management/commercial timber harvest.

Refuge Name: Merritt Island National Wildlife Refuge

Establishing and Acquisition Authorities: Migratory Bird Conservation Act; North American Wetlands Conservation Act

Refuge Purposes: Due to its nature as an overlap of the Kennedy Space Center, National Aeronautics and Space Administration and its unique location and resources, the refuge has two traditional purposes, as well as an additional purpose stemming from legislation that created a unit of the National Park Service. Recognizing the high migratory bird benefits served by the lands and waters of the refuge, the Service administratively designated Merritt Island National Wildlife Refuge in 1963 under the provisions of the Migratory Bird Conservation Act, outlining a primary purpose of these lands and waters:

"... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds."

16 USC §715d (Migratory Bird Conservation Act)

Further reading of the Migratory Bird Conservation Act also recognizes benefits to other species, including those designated as threatened or endangered:

"... to conserve and protect migratory birds ... and other species of wildlife that are listed ... as endangered species or threatened species and to restore or develop adequate wildlife habitat."

16 USC §715i (Migratory Bird Conservation Act)

The refuge's primary purpose applies to all lands and waters managed by the refuge, regardless of when they were added to the refuge. Since the refuge has management agreements with

NASA and the State of Florida, lands and waters under those management agreements are also subject to the conditions of those agreements.

In 1995, under the authority of the North American Wetlands Conservation Act, the refuge and its partners began purchasing additional lands and waters in the northwest corner of the refuge, the Turnbull Creek area:

“(1) to protect, enhance, restore, and manage an appropriate distribution and diversity of wetland ecosystems and other habitats for migratory birds and other fish and wildlife in North America; (2) to maintain current or improved distributions of migratory bird populations; and (3) to sustain an abundance of waterfowl and other migratory birds consistent with the goals of the North American Waterfowl Management Plan and the international obligations contained in the migratory bird treaties and conventions and other agreements with Canada, Mexico, and other countries.”

16 USC §4401(2)(b) (North American Wetlands Conservation Act)

This secondary purpose applies only to those lands and waters of the Turnbull Creek area of the refuge. However, the primary purpose also applies to the lands and waters of the Turnbull Creek area. Again, since the refuge has management agreements with the State of Florida for lands and waters in the Turnbull Creek area, those lands and waters are also subject to the conditions of those agreements.

Congruent to the discussion of the traditional purposes of the refuge is the congressional enabling legislation in 1975 that established Canaveral National Seashore as a unit of the National Park Service. Congress established the Seashore partially on new lands and waters and partially as an overlay of NASA’s Kennedy Space Center on lands and waters that were already being managed as part of Merritt Island National Wildlife Refuge. In the legislation, Congress outlined that the majority of the overlay portion of the Seashore would be managed as a refuge. The overlay area encompasses approximately 34,345 acres and includes southern Mosquito Lagoon. The Seashore was established “... to preserve and protect the outstanding natural, scenic, scientific, ecologic, and historic values ... and to provide for public outdoor recreation use and enjoyment of the same ... the Secretary shall retain such lands in their natural and primitive condition, shall prohibit vehicular traffic on the beach except for administrative purposes, and shall develop only those facilities which he deems essential for public health and safety” [16 USC 459(j)]. This language applies much as a Wilderness designation might apply, making this a secondary purpose for the 34,345 acres in the overlap area.

National Wildlife Refuge System Mission: The mission of the National Wildlife Refuge System, as defined by the National Wildlife Refuge System Improvement Act of 1997, is:

“ ... to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.”

Public Review and Comment: Following the initial gathering of information, a Notice of Intent to prepare a CCP for the refuge was published in the Federal Register on August 26, 2002. The Service also placed ads in local newspapers, posted information on the refuge’s web site regarding upcoming meetings and how to submit comments, posted meeting information in the

local community (e.g., at local shops, at the refuge's Visitor Center, and at the local libraries), and sent out flyers announcing the public meetings. An open house at the refuge's Visitor Center kicked off the public scoping phase on September 21, 2002. Over 180 people attended the open house which was followed by three public scoping meetings: October 23, 2002 in south Merritt Island with 31 attendees; October 28, 2002 in New Smyrna Beach with 17 attendees; and October 29, 2002 in Titusville with 55 attendees. During September and October 2002, 10 CCP related articles appeared in three local papers: Florida Today, Orlando Sentinel, and Press Tribune. One article appeared in November 2002 to review the wide range of plan comments submitted to the Service. During public scoping, over 1,600 written comments were submitted by individuals and organizations spanning 49 states and 11 countries. Two planning updates kept the public informed of the progress of the plan. Follow up meetings were scheduled in 2004 to address the public's concerns specific to Mosquito Lagoon: April 29, 2004 in Titusville with 65 attendees; May 12, 2004 in New Smyrna Beach with 25 attendees; November 8, 2004 in Titusville with 7 attendees; and November 22, 2004 in New Smyrna Beach with 32 attendees.

Several outreach activities occurred in advance of public review and comment on the DCCP and EA. In March 2006, over 1,400 postcards were mailed out to individuals, organizations, businesses, and governmental agencies to allow them to request copies of the DCCP and EA. About 100 responded, requesting copies. And over 75 additional copies of the DCCP and EA were distributed from the refuge's Visitor Center. The refuge briefed key governmental agencies: Kennedy Space Center, National Aeronautics and Space Administration; Florida Fish and Wildlife Conservation Commission; Canaveral National Seashore, National Park Service; and Cape Canaveral Air Force Station and Patrick Air Force Base, U.S. Air Force. Press releases were sent out to 15 newspapers, including three area papers: Florida Today, Daytona Beach News-Journal, and the Orlando Sentinel. Two news articles on the CCP appeared before public review and comment. [Throughout the planning process numerous articles appeared in Florida Today, Star Advocate (of Florida Today), Daytona Beach News-Journal, the Orlando Sentinel, Florida Sportsman, Wilderness, Coastal Angler, Eastern Fly Fishing, Florida Wing Beats (Florida Ducks Unlimited newsletter), and HabiChat (newsletter of Merritt Island Wildlife Association).] The Notice of Availability of the DCCP and EA was published in the Federal Register on December 27, 2006.

The public review and comment period for the DCCP and EA for Merritt Island National Wildlife Refuge opened on December 27, 2006 and closed on February 26, 2007. A few comments were received after the deadline. Written comments were submitted by 22 members of the general public, three state government agencies, three area businesses, three researchers or research entities, and one organization. Comments were also submitted through the State of Florida's clearinghouse, representing comments from four state government agencies. Comments were submitted by two federal agencies: Kennedy Space Center, National Aeronautics and Space Administration and Canaveral National Seashore, National Park Service. The government agencies submitting comments during the public review and comment period included: Florida Fish and Wildlife Conservation Commission, Division of Historical Resources of the Florida Department of State, St. Johns River Water Management District, Florida Department of Environmental Protection, and Florida Department of Transportation. The proposed activity was determined by the State of Florida to be consistent with the Florida Coastal Management Program. Appendix J summarizes the comments received during the public review and comment period and the Service's Response to those comments.

Description of Use: *Upland Hunting*

Hunting has been identified as a priority wildlife-dependent activity under the National Wildlife Refuge System Improvement Act. With the implementation of the comprehensive conservation plan, the Service will take the steps necessary (e.g., develop needed regulations and publish the appropriate Federal Register notice) to open the refuge to upland hunting for deer and feral hogs in a portion of the refuge's upland habitat in cooperation with the state. This will provide additional opportunities for a priority recreational activity and help to reduce the feral hog population on the refuge. Implementing the upland hunt will first require preparing a hunt plan; posting appropriate notice in the Federal Register; and establishing regulations in Title 50, Code of Federal Regulations.

Upland hunting for white-tailed deer and feral hogs will be designated in the area north of Haulover Canal on approximately 6,083 acres of the refuge's over 140,000 acres. A quota will be established for the number of hunters. The remainder of the refuge will remain closed to upland hunting to minimize conflicts with other priority uses and for Kennedy Space Center security reasons. The area north of Haulover has the highest deer population. The upland game hunt will be conducted in cooperation with the Florida Fish and Wildlife Conservation Commission.

Availability of Resources: The details for administering the program have not been determined. It is assumed that a quota permit will be charged for the hunting opportunity to cover the costs of managing the program. Funds would be needed annually to mow, grade, and fix roads and parking areas open to hunter access; maintain signs; and print leaflets. The selection process for permits will likely be processed through the existing state system. Management of the program has a biological, administrative, maintenance, and law enforcement component. Partnering with the state will help provide the needed components.

Anticipated Impacts of Use: Anticipated impacts were identified and evaluated based on best professional judgment and published scientific papers. Many of the impacts associated with upland hunting are similar to those considered for other public use activities, such as waterfowl hunting and wildlife viewing and photography, with the exception of direct mortality to game species, short-term changes in the distribution and abundance of game species, and unrestricted travel through the hunt area. Direct mortality can impact isolated, resident game species populations by reducing breeding populations to a point where the isolated population can no longer be sustained. This can result in localized extirpation of isolated populations.

The hunt would be conducted in upland habitats; therefore minimal disturbance to migratory birds is anticipated. Use of lead shot could be allowed for deer and feral hogs, but considering the separation between the upland hunt and wetland habitat, the ingestion of lead shot by migratory birds should be minimal. The walk-in hunters would use existing fire breaks and roads for access. No soil compaction or vegetation disturbance is expected. Parking would occur in temporary sites designated along existing fire lines. Hunting would not occur within 1,500 feet of any active eagle nest.

The refuge has an active hog removal program where the permittees trap and remove feral hogs in four geographic areas of the refuge. The area proposed for the upland hunt would be located in the northern geographic hog trapping zone. The primary intentions of feral hog hunts would be to increase pressure on this population and assist in the population control of this unwanted species. Upland hunting for feral hogs would help reduce the hog population in this

area, while also reducing the availability of hogs for the feral hog trapping permittee. This activity would assist the refuge in the control of this species.

Determination (check one below):

	Use is Not Compatible
X	Use is Compatible, with the Listed Stipulations

Stipulations Necessary to Ensure Compatibility: Several stipulations will be necessary to ensure compatibility of this use. Additional stipulations may be added, as the program is developed with the state. Known stipulations are listed:

- The hunt will be conducted in accordance with state regulations and seasons.
- The methods of hunting to be considered include primitive weapons, archery, and shotguns.
- Only white-tailed deer and feral hogs will be hunted in the designated area.
- Quota hunt permits will be issued.
- Hunting densities no greater than one hunting party per 100 acres will be allowed.
- The number of deer permitted to be taken will be based on annual population estimates.
- Check stations will be used to collect hunt data and to monitor the quality of the hunt.
- Vehicle access and parking will be limited and confined to existing fire lanes and unimproved roads.
- Climbing spikes and permanent stands will not be permitted.
- Off road vehicles or ATVs will not be permitted.
- Liberal bag limits or extended seasons may be established for feral hogs as part of a wider effort to eliminate this nonnative species.
- No flagging or trail marking will be permitted.

Upland hunting would have little impact on other visitor activities. The Pine Flatwoods Trail is proposed in the area north of Haulover Canal. Two boat ramps and several waterfowl hunter and fishing access roads also traverse through the area proposed for upland hunting. A closed area for hunters will be established to provide at a safe buffer distance around all public use facilities.

Justification: Hunting is a priority wildlife-dependent use under the National Wildlife Refuge System Improvement Act. Upland hunting, as described, was determined to be compatible, in view of the potential impacts that hunting can have on the Service's ability to achieve purposes and goals of the refuge, because: (1) hunter densities and use levels will be relatively low during days the refuge is open to hunting, (2) sufficient restrictions have been established to ensure that an adequate amount of high-quality habitat would be available to accommodate the needs of deer and other wildlife using the refuge, and (3) sufficient opportunities are available for other priority wildlife-dependent recreation during the upland hunt season.

Mandatory 15-Year Re-evaluation Date: 09/27/2022

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Approval of Compatibility Determinations:

The signature of approval covers all the compatibility determinations considered within the Comprehensive Conservation Plan for Merritt Island National Wildlife Refuge. If one of the descriptive uses is considered for compatibility outside of the plan, the approval signature becomes part of that determination.

Signature:

Ron Hight 6/19/08
Refuge Manager Date

Review:

Camela Han 6/20/08
Regional Compatibility Coordinator Date

Review:

Actg Holly Sabourant 6/24/08
Refuge Supervisor Date

Concurrence:

Jim Muff 7-1-08
Regional Chief
National Wildlife Refuge System
Southeast Region Date